UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/800,397	03/05/2001	Alok Sharma	0023-0135	2689

44987 7590 12/07/2010
HARRITY & HARRITY, LLP
11350 Random Hills Road
SUITE 600
FAIRFAX, VA 22030

EXAMINER	
ZHONG, JUN FEI	
ART UNIT	**PAPER NUMBER**
2426	

MAIL DATE	DELIVERY MODE
12/07/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 09/800,397
Filing Date: March 05, 2001
Appellant(s): SHARMA, ALOK

Sadiq A. Ansari
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 9/23/2010 appealing from the Office action mailed 4/14/2010.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

Claims 1, 3-10, 12-17 and 22-40.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

6721371	Barham	5-2002
6466913	Yasuda	10-2002
6721872	Dumlop	4-2004
6650624	Quigley	11-2003
5768682	Peyrovian	6-1998

Proakis and Manolakis, "Digital Signal Processing: Principles, Algorithms, and Applications", ISBN 133737624 (1996), pages 698-700.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

1. Claims 1, 3-4, 16-17, 22-26 and 37-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barham et al. (Patent # US 6721371 B1) in view of Yasuda (Patent # US 6466913) and Proakis et al. ("Digital Signal Processing: Principles, Algorithms, and Applications" by Proakis and Manolakis, ISBN 0133737624, 1996).

As to claim 1, Barham discloses a method for provisioning multiple digital receivers, comprising:

providing an analog to digital converter (e.g., analog to digital converter 102; Fig. 18) having an analog input and a digital output (see col. 3, lines 50-56);

providing a plurality of digital receivers (e.g., demodulators 10; Fig. 18), each receiver having a programmable center frequency (e.g., reconfigurable FIR filter where the center frequencies are programmable) (see col. 6, lines 56-63),

where the plurality of digital receivers are to receive digitized samples from the analog to digital converter and where each of the plurality of digital receivers includes a low-pass digital filter (e.g., the digitized samples are coupled to each demodulators 10 through demultiplexer 103; each demodulator 10 includes reconfigurable FIR filter 14; Fig. 1b, 18) (see col. 5, lines 49-60; col. 6, lines 56-63);

each set corresponding to one of the plurality of low-pass digital filters (i.e., there are multiple demodulators 10 in Fig. 18, and each demodulator 10 has a reconfigurable

FIR filter 14 in Fig. 1b. The system Barham discloses inherently has a set of coefficients for an FIR filter; different sets of coefficients would load into the FIR filter in order to change the characteristic of the FIR filter (reconfigurable). Therefore, the system Barham discloses inherently has multiple sets of coefficients, and each set corresponding to one FIR filter), each filter having one of a predetermined set of bandwidths (e.g., each FIR filter has a preset bandwidth for filtering signals) (see col. 3, line 43 through col. 6, line 63);

receiving a request to provision a selected one of the plurality of digital receivers (e.g., receive pointer information; pointer 124 points to a demodulator) (see col. 4, line 58-col. 5, line 9; Fig. 19);

Barham discloses memory for storing (see abstract; col. 4, lines 45-50)

Barham does not specifically disclose maintaining filter coefficients in storage.

In an analogues art, Yasuda discloses maintaining pre-computed sets of filter coefficients in non-volatile storage (e.g., coefficient ROM 202, 302; Fig. 3, 4) (see col. 5, lines 39-42; col. 6, lines 52-62; col. 16, lines 9-21),

selecting a first center frequency and a first bandpass bandwidth for provisioning the selected one of the plurality of demodulators digital receivers (e.g., CPU 301 selects coefficients to transmit to each FIR filter 312a, 312b, 322a, 322b; Fig. 4; i.e., when a set of coefficients is selected for an FIR filter, the transfer function of the FIR filter is set, and the center frequency and bandpass bandwidth are also set based on the calculation) (col. 7, lines 1-9);

retrieving the filter coefficients associated with the first bandpass bandwidth (e.g., CPU 301 transmits coefficients to each FIR filter 312a, 312b, 322a, 322b from ROM 202/302; Fig. 4) (see col. 7, lines 1-9, 50-67);

subjecting the retrieved filter coefficients to a transformation corresponding to the first center frequency (e.g., filter coefficient determine unit 37 determines filter coefficients based on initial parameter and optimum parameter; Fig. 7) (see col. 7, lines 1-9, 50-67; col. 8, lines 1-18; col. 10, lines 28-47; col. 11, lines 22-59)

loading the transformed filter coefficients into coefficient latches in the selected one of the plurality of digital receivers (e.g., loading the optimum set of coefficients to FIR filter buffer; Fig. 4) (see col. 7, lines 1-9, 50-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have coefficients storage as taught by Yasuda to the FIR filter of Barham in order to provide an FIR filter that is capable filtering variety of frequency ranges by change the coefficients of the FIR filter and without change the hardware.

Barham and Yasuda do not specifically disclose the coefficient optimization using a bandpass transformation.

Proakis discloses a bandpass transformation of the FIR filter's coefficients (see pages 698-700).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have bandpass transformation as taught by Proakis to the FIR filter of Barham as modified by Yasuda in order to provide an FIR filter that can perform frequency transformations either in analog or digital domain.

As to claim 3, Barham discloses the method of claim 1, further including:

reconfigurable FIR filter (see col. 4, line 11 through col. 6, line 63);

Barham does not specifically disclose the first center frequency and the second center frequency;

Yasuda discloses operating the selected one of the plurality of digital receivers at the first center frequency (e.g., CPU 301 selects coefficients for each FIR filter 312a, 312b, 322a, 322b; Fig. 4) (col. 7, lines 1-9);

subsequent to said operating, loading the coefficient latches in the selected one of the plurality of digital receivers with transformed coefficients corresponding to a second center frequency (e.g., CPU 301 selects different coefficient set to each FIR filter 312a, 312b, 322a, 322b; Fig. 4) (see col. 6, lines 52-62; col. 7, lines 1-9); and

operating the selected one of the plurality of digital receivers at the second center frequency (e.g., loading modified FIR coefficients to FIR filter buffer) (see col. 7, lines 1-9).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have coefficients storage as taught by Yasuda to the FIR filter of Barham in order to provide an FIR filter that is capable filtering variety of frequency ranges by change the coefficients of the FIR filter, without change the hardware.

As to claim 4, Barham discloses the method of claim 3, further including:

Multiple reconfigurable FIR filters (i.e., there are multiple demodulators 10 in Fig. 18, and each demodulator 10 has a reconfigurable FIR filter 14 in Fig. 1b, different sets of coefficients would load into the FIR filter in order to change the characteristic of the FIR filter (reconfigurable). Therefore, the system Barham discloses inherently has multiple sets of coefficients, and each set corresponding to one FIR filter) (see col. 4, line 11 through col. 6, line 63);

Barham does not specifically disclose the bandwidth and the center frequency of the FIR filter.

Yasuda discloses selecting a center frequency and a bandpass bandwidth for provisioning a second one of the plurality of digital receivers, wherein said first and second bandpass bandwidths are unequal (e.g., different sets of FIR coefficients are representing different bandpass bandwidths);

retrieving the filter coefficients associated with the bandwidth;

subjecting the retrieved filter coefficients to a transformation corresponding to the center frequency (e.g., filter coefficient determine unit 37 determines filter coefficients based on initial parameter and optimum parameter; Fig. 7) (see col. 7, lines 1-9, 50-67; col. 8, lines 1-18; col. 10, lines 28-47; col. 11, lines 22-59) ; and

loading the transformed coefficients into coefficient latches in the second one of the plurality of digital receivers (e.g., loading modified FIR coefficients to FIR filter buffer) (see col. 7, lines 1-9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have coefficients storage as taught by Yasuda to the FIR filter of

Barham in order to provide an FIR filter that is capable filtering variety of frequency ranges by change the coefficients, without change the hardware.

Barham and Yasuda do not specifically disclose the coefficient optimization using a bandpass transformation.

Proakis discloses a bandpass transformation of the FIR filter's coefficients (see pages 698-700).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have bandpass transformation as taught by Proakis to the FIR filter of Barham as modified by Yasuda in order to provide an FIR filter that can perform frequency transformations either in analog or digital domain.

As to claim 16, Barham discloses the method of claim 1, wherein each of the plurality of digital receivers includes a finite impulse response (FIR) digital filter (see col. 3, lines 51-55; col.5, lines 49-52).

As to claim 17, the method of claim 16, wherein one or more of said FIR digital filters is an Optimum Equiripple Linear-Phase filter (i.e., this is a matter of design choice as known to those ordinary skill in the art of filter design).

As to claims 22-23, the claimed number of the filter coefficients for each filter is at least 16 (claim 22) and is at most 24 (claim 23) is also a matter of design choice, which is well known to those of ordinary skill in the art of filter design, in addition to, as is well

known in the art, tradeoffs must be made between passband ripple (less is better), stopband attenuation (more is better), for a fixed number of coefficients. Therefore, the number of coefficients selected by the inventor or designer is relative to the type of tradeoff benefits the designer would like to gain or lose as described above.

As to claims 24-26 and 37-40, the claims are met by the rejection of claims 1, 3-4, 16-17 and 22-23, as described above.

2. Claims 8 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barham et al. (Patent # US 6721371 B1) in view of Yasuda (Patent # US 6466913), further in view of Proakis et al. ("Digital Signal Processing: Principles, Algorithms, and Applications" by Proakis and Manolakis, ISBN 0133737624, 1996), and further in view of Dumlop et al. (Patent # US 6721872).

As to claim 8, note the discussions above, Barham discloses the method of claim 1, wherein the analog to digital converter, the plurality of digital receivers (e.g., bank or array of IC demodulators 10), and storage (e.g., registers or memory) (see col. 3, lines 53-55; col. 4, lines 45-50; col. 5, lines 49-57).

Barham does not specifically disclose a non-volatile storage.

Yasuda discloses non-volatile storage (e.g., ROM 202, 302; Fig. 4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have coefficients storage in a non-volatile storage as taught by

Yasuda to the FIR filter of Barham in order to provide an storage with faster access speed.

Barham and Yasuda do not specifically disclose the coefficient optimization using a bandpass transformation.

Proakis discloses bandpass transformation for FIR filter coefficients.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have bandpass transformation as taught by Proakis to the FIR filter of Barham as modified by Yasuda in order to provide an FIR filter that can perform frequency transformations either in analog or digital domain.

Barham, Yasuda and Proakis do not specifically disclose all the devices implemented on a single integrated circuit.

Dumlop discloses a single integrated circuit (e.g., a line card in a single chip) (see col. 3, line 50-col. 4, line 38; col. 8, lines 27-39; Fig. 2)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a single chip line card as taught by Dumlop to the FIR filter of Barham as modified by Yasuda and Proakis provide a single chip network interface card in the headend site in order to save space for the circuitry.

3. Claims 5-7, 13, 27-29 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barham et al. (Patent # US 6721371 B1) in view of Yasuda (Patent # US 6466913), further in view of Proakis et al. ("Digital Signal Processing: Principles,

Algorithms, and Applications" by Proakis and Manolakis, ISBN 0133737624, 1996), and further in view of Quigley et al. (Patent # US 6650624).

As to claim 5, note the discussion above, Barham discloses a high speed demodulator system (see col. 4, line 11 through col. 6, line 63).

Barham and Yasuda do not specifically disclose the coefficient optimization using a bandpass transformation.

Proakis discloses bandpass transformation for FIR filter coefficients.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have bandpass transformation as taught by Proakis to the FIR filter of Barham as modified by Yasuda in order to provide an FIR filter that can perform frequency transformations either in analog or digital domain.

Barham, Yasuda and Proakis fail to disclose CMTS.

Quigley discloses a CMTS channel bank organized into upstream and downstream channels (e.g., a plurality of demodulators 700a-700n, which receives modulated data input from a plurality of cable modems via a common transmission medium. The demodulators 700a-700n provide a demodulated data output for the frequency division multiplexed (FDM) upstream channels via which data is transmitted from the plurality of cable modems to the CMTS) (see col. 37, lines 29-45; Fig. 26).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the CMTS as taught by Quigley to the FIR filter of

Barham as modified by Yasuda and Proakis in order to enhance the data rate and/or reliability of upstream communications (see col. 3 lines 29-32).

As to claim 6, the claimed ratio of the number of upstream channels demodulated by the CMTS channel bank to a number of upstream input connectors of the CMTS channel bank is M (i.e., this is a matter of design choice as appreciated by one of ordinary skill in the art in the design of CMTS architecture).

As to claim 7, the claimed method of claim 6, wherein M is 16 is rejected on the same grounds as claim 6, since the claim has similar scope as claim 6.

As to claim 13, the claimed CMTS is DOCSIS compatible (i.e., it is well known in the art of cable modem technology that a CMTS is DOCSIS compatible).

As to claims 27-29 and 33, the claims are met by the rejection of claims 5-7 and 13, as described above.

4. Claims 14-15 and 34-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barham et al. (Patent # US 6721371 B1) in view of Yasuda (Patent # US 6466913), further in view of Proakis et al. ("Digital Signal Processing: Principles, Algorithms, and Applications" by Proakis and Manolakis, ISBN 0133737624, 1996),

further in view of Quigley et al. (Patent # US 6650624), and further in view of Peyrovian (Patent # US 5768682).

As to claim 14, note the discussion above, Barham discloses a high speed demodulator system (see col. 4, line 11 through col. 6, line 63).

Barham, Yasuda, Proakis and Quigley fail to disclose upstream channels are in the 750-1000 MHz, which is well known to those of ordinary skill in the art of transmitting data over cable service.

Peyrovian discloses the upstream channels are in the 750- 1000 MHz portion of the spectrum (see col. 3, lines 38-53)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the 750-1000 MHz portion of the spectrum as taught by Peyrovian to the FIR filter of Barham as modified by Yasuda, Proakis and Quigley because the high frequency band is typically much less susceptible to noise than the low frequency band that has traditionally been employed to carry the upstream information. Further, the frequency band of 750-1000 MHz has a much greater bandwidth than the low frequency band (see col. 3 lines 38-53).

As to claim 15, regarding the claimed at least one frequency stacker is used to densely pack each sub-band of the 750-1000 MHz spectrum portion (Official Notice is taking that it is well known in the art of data transmission over cable service to densely pack each sub-band of a given radio frequency (RF) spectrum portion (i.e. 750-1000

MHz) using at least one frequency stacker, for the advantage of efficiently using each sub-band in the given frequency spectrum so that the maximum amount of sub-bands in the spectrum may be used for sending data over the cable line. Therefore, it is submitted that it would have been clearly obvious to one of ordinary skill in the art at the time of the invention to have used at least one frequency stacker to densely pack each sub-band of the 750-1000 MHz spectrum portion for the advantage given above).

As to claims 34-35, the claims are met by the rejection of claims 14-15, as described above.

5. Claims 9-10, 12, and 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barham et al. (Patent # US 6721371 B1) in view of Yasuda (Patent # US 6466913), further in view of Proakis et al. ("Digital Signal Processing: Principles, Algorithms, and Applications" by Proakis and Manolakis, ISBN 0133737624, 1996), further in view of Quigley et al. (Patent # US 6650624), and in further view of the Applicant's admitted prior art in Fig. 17(A).

As to claim 9, note the discussion above, Barham, Yasuda, Proakis and Quigley do not specifically disclose the claimed CMTS channel bank is organized using a plurality of modules, each module having a plurality of downstream channels and a plurality of upstream channels.

The claimed CMTS channel bank is organized using a plurality of modules, each module having a plurality of downstream channels and a plurality of upstream channels is met by the admitted prior art Fig. 17(A), that discloses a CMTS channel bank with a module of downstream connectors for channels and 16 upstream connectors for channels and there are 8 modules in the bank, which directly corresponds to the claimed features.

Therefore, it is submitted that it would have been clearly obvious to one of ordinary skill in the art at the time of the invention to have using a plurality of modules, each module having a plurality of downstream channels and a plurality of upstream channels for the benefits of supporting multiple communication channels in both direction at the same time. Thus, the claimed features are not patentable in view of the disclosure of the admitted prior art.

As to claim 10, note the discussion above, Barham, Yasuda, Proakis and Quigley do not specifically disclose the number of the upstream channels is 4 times a number of the downstream channels

The claimed number of the upstream channels is 4 times a number of the downstream channels is met by admitted prior art Fig. 17(A), that discloses a CMTS channel bank with a module of 16 upstream connectors for channels and 4 downstream connectors for channels and there are 8 modules in the bank, which directly corresponds to the claimed features.

Therefore, it is submitted that it would have been clearly obvious to one of ordinary skill in the art at the time of the invention to have using upstream channels is 4 times a number of the downstream channels for the benefits of optimize multiple channels communication. Thus, the claimed features are not patentable in view of the disclosure of the admitted prior art.

As to claim 12, note the discussion above, Barham, Yasuda, Proakis and Quigley do not specifically disclose the CMTS channel bank has 4 times as many upstream channels as downstream channels.

The claimed CMTS channel bank has 4 times as many upstream channels as downstream channels is met by admitted prior art Fig. 17(A), that discloses a 32 downstream by 128 upstream CMTS channel bank, which directly corresponds to the claimed feature.

Therefore, it is submitted that it would have been clearly obvious to one of ordinary skill in the art at the time of the invention to have using upstream channels is 4 times a number of the downstream channels for the benefits of optimize multiple channels communication. Thus, the claimed features are not patentable in view of the disclosure of the admitted prior art.

As to claims 30-32, the claims are met by the rejection of claims 9-10 and 12, as described above.

(10) Response to Argument

The examiner respectfully disagrees that the rejection should be reversed. Only those actual arguments raised by appellant's are being treated in the Examiner's Answer. Any further arguments regarding other elements or limitations not specifically argued that the appellant could have made are considered by the examiner as having been conceded by the appellant for the basis of the decision of this appeal. Accordingly, they are not being addressed by the examiner for further consideration by the panel. Should the panel find that the examiner's position/arguments or any aspect of the rejection is not sufficiently clear or a particular issue is of need of further explanation, it is respectfully requested that the case be remanded to the examiner for further explanation prior to the rendering of a decision.

Issue A:

Appellant's arguments regarding the rejection of claims 1, 3, 4, 16, 17, 22-26, and 37-40 under 35 U.S.C. § 103(a) are not persuasive.

1. Claims 1, 3, 4, 16, 17, 22 and 23.

Claim1

a) Appellant argues "BARHAM et al., YASUDA et al., and PROAKIS et al. do not disclose or suggest retrieving filter coefficients associated with a first bandpass bandwidth" (Appeal Brief, page 11, lines 8-11).

The examiner respectfully disagrees. Barham discloses a reconfigurable FIR filter and memory for storing data (e.g., registers or memory) (see Barham col. 3, lines 53-55; col. 4, lines 45-50; col. 5, lines 49-57; col. 6, lines 56-63). Barham does not specifically disclose maintaining the filter coefficients in the memory. Skilled artisans would recognize the coefficients of the reconfigurable digital FIR filter must stored in storage in order for the system to reconfigure the FIR filter (one set of the coefficients represents one FIR filter). In an analogues art, Yasuda discloses maintaining pre-computed sets of filter coefficients in coefficient ROM 202 or 302 (Fig. 3, 4) (see Yasuda col. 5, lines 39-42; col. 6, lines 52-62; col. 16, lines 9-21), the CPU 301 selects which set of the coefficients to transmit from the coefficient buffer to the FIR filter. Because the set of coefficients is representing the transfer function of the FIR filter, once the set of coefficients is selected, the FIR filter is set, and the center frequency and bandpass bandwidth of the filter are also selected (also works reversely). Each set of the coefficients is associated with one FIR filter (uniquely one to one correlation).

Yasuda clearly showing the coefficients are loaded from the coefficient buffer to the corresponded FIR filter. When CPU 301 calculates which filter to use, the CPU is retrieving the filter (the filter coefficients) (see Yasuda col. 7, lines 1-9, 50-67; Fig. 4). The system retrieving the filter coefficients based on the selection of the FIR filter (center frequency and bandpass bandwidth of the FIR filter). Although Yasuda does not use the exact same word “bandpass bandwidth”, skilled artisans would recognize each filter has a unique characteristic (which represented by the center frequency, pass through frequency range (bandpass bandwidth) and impulse response etc.). In another

word, selecting a set of the coefficients is equivalent to select a digital filter, and the bandpass bandwidth is one of the features of the filter (or selecting a digital filter is equivalent to select a set of the coefficients of the filter). Thus, the combination of Barham, Yasuda and Proakis disclose the claimed limitation.

b) Appellant argues "Since BARHAM et al., YASUDA et al., and PROAKIS et al. do not disclose or suggest retrieving filter coefficients associated with a first bandpass bandwidth, BARHAM et al., YASUDA et al., and PROAKIS et al. cannot reasonably be construed as disclosing or suggesting subjecting the retrieved filter coefficients (which are associated with a first bandpass bandwidth) to a bandpass transformation corresponding to a first center frequency" (Appeal Brief, page 12, lines 4-8).

The examiner respectfully disagrees. The combination of Barham, Yasuda and Proakis do disclose the claimed limitation "retrieving filter coefficients associated with a first bandpass bandwidth" (see issue *A1* above). Yasuda discloses the filter coefficient determine unit 37 determines filter coefficients based on initial parameter and optimum parameter, and calculating the optimum parameter meets the limitation "subjecting the retrieved filter coefficients" (see col. 7, lines 1-9, 50-67; col. 8, lines 1-18; col. 10, lines 28-47; col. 11, lines 22-59) and Proakis discloses bandpass transformation for FIR filter coefficients (see Proakis pages 698-700). Thus, the combination of Barham, Yasuda and Proakis disclose the claimed limitation.

c) Appellant argues "Appellant submits that the Examiner's allegation is merely a conclusory statement of an alleged benefit of the combination." (Appeal Brief, page 12-13).

In KSR International Co. v. Teleflex Inc., the Court found that if all the claimed elements are known in the prior art then one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yield predictable results to one of ordinary skill in the art at the time of the invention. In this case, skilled artisans would recognize loading different sets of coefficient to the digital FIR filter which would yield different FIR filters, thus the system has the benefit of filtering variety of frequency ranges by using the same components. One skilled in the art could have generally combined the elements as claimed, because the claimed elements no change in their respective functions, and the combination would have yield predictable results. Same reasons also apply to combine Proakis' reference to Barham and Yasuda, by applying a known technique to a known device (method or product) ready for improvement and yield predictable results. Combining the bandpass transformation for FIR filter coefficients as taught by Proakis the system of Barham and Yasuda would yield the benefit of transferring filters in different domains (analog or digital domain) to suit the designer's need.

It must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Claims 3, 4, 16, 17, 22 and 23, appellant merely argues without specifically point out any errors. Therefore, the examiner maintains the rejections.

2. Claims 24-26 and 37-40.

Claim 24

a) Appellant argues "BARHAM et al., YASUDA et al., and PROAKIS et al. do not disclose or suggest means for retrieving filter coefficients associated with a first bandpass bandwidth, as recited in claim 24" (Appeal Brief, page 14, lines 14-17).

In response, the examiner respectfully disagrees. Because the correspond "means for" is discussed with respect the discussion of claim 1 above, which the combination of references Barham, Yasuda and Proakis meet the "means for" by equivalency (see discussion of claim 1 above).

b) Appellant argues "BARHAM et al., YASUDA et al., and PROAKIS et al. do not disclose or suggest means for subjecting the retrieved filter coefficients (which are associated with a first bandpass bandwidth) to a bandpass transformation corresponding to a first center frequency, as also recited in claim 24" (Appeal Brief, page 15, lines 8-11).

In response, the examiner respectfully disagrees. Because the correspond "means for" is discussed with respect the discussion of claim 1 above, which the combination of references Barham, Yasuda and Proakis meet the "means for" by equivalency (see discussion of claim 1 above).

c) Appellant argues “Appellant submits that the Examiner's allegation is merely a conclusory statement of an alleged benefit of the combination.” (Appeal Brief, page 15-16).

In KSR International Co. v. Teleflex Inc., the Court found that if all the claimed elements are known in the prior art then one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yield predictable results to one of ordinary skill in the art at the time of the invention. In this case, skilled artisans would recognize loading different sets of coefficient to the digital FIR filter which would yield different FIR filters, thus the system has the benefit of filtering variety of frequency ranges by using the same components. One skilled in the art could have generally combined the elements as claimed, because the claimed elements no change in their respective functions, and the combination would have yield predictable results. Same reasons also apply to combine Proakis’ reference to Barham and Yasuda, by applying a known technique to a known device (method or product) ready for improvement and yield predictable results. Combining the bandpass transformation for FIR filter coefficients as taught by Proakis the system of Barham and Yasuda would yield the benefit of transferring filters in different domains (analog or digital domain) to suit the designer's need.

It must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the

applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Claims 25-26 and 37-40, appellant merely argues without specifically point out any errors. Therefore, the examiner maintains the rejections.

Issue B:

Appellant's arguments regarding the rejection of claims 8 and 36 under 35 U.S.C. § 103(a) are not persuasive.

1. Claim 8.

Appellant argues "the cited references do not disclose or suggest that an analog to digital converter, a plurality of digital receivers, and a non-volatile storage are implemented on a single integrated circuit" (Appeal Brief, page 17, lines 11-13).

The examiner respectfully disagrees. Barham discloses the analog to digital converter, the plurality of digital receivers (e.g., bank or array of IC demodulators 10), and storage (e.g., registers or memory) (see col. 3, lines 53-55; col. 4, lines 45-50; col. 5, lines 49-57). Yasuda discloses non-volatile storage (e.g., ROM 202, 302; Fig. 4). Dumlop discloses a single integrated circuit (e.g., a line card in a single chip) (see col. 3, line 50-col. 4, line 38; col. 8, lines 27-39; Fig. 2). Dumlop reference is used to teach combining different elements into a single chip (integrated circuit). Since all the elements are disclosed by the cited references, it would have been clearly obvious to

one of ordinary skill in the art at the time of the invention to combine all the elements as teach by Barham and Yasuda into one single chip as taught by Dumlop for compact circuit design.

2. Claim 36.

Appellant argues "the cited references do not disclose or suggest that an analog to digital converter, a plurality of digital receivers, and a non-volatile storage are implemented on a single integrated circuit" (Appeal Brief, page 19, lines 9-11).

The examiner respectfully disagrees. Barham discloses the analog to digital converter, the plurality of digital receivers (e.g., bank or array of IC demodulators 10), and storage (e.g., registers or memory) (see col. 3, lines 53-55; col. 4, lines 45-50; col. 5, lines 49-57). Yasuda discloses non-volatile storage (e.g., ROM 202, 302; Fig. 4). Dumlop discloses a single integrated circuit (e.g., a line card in a single chip) (see col. 3, line 50-col. 4, line 38; col. 8, lines 27-39; Fig. 2). Dumlop reference is used to teach combining different elements into a single chip (integrated circuit). Since all the elements are disclosed by the cited references, it would have been clearly obvious to one of ordinary skill in the art at the time of the invention to combine all the elements as teach by Barham and Yasuda into one single chip as taught by Dumlop for compact circuit design.

Issue C:

Appellant's arguments regarding the rejection of claims 5-7, 13, 27-29 and 33 under 35 U.S.C. § 103(a) are not persuasive.

1. Claims 5, 6 and 13

Appellant argues "Claims 5, 6, and 13 depend from claim 1. Without acquiescing in the rejection of claims 5, 6, and 13, the disclosure of QUIGLEY et al. does not remedy the deficiencies in the disclosures of BARHAM et al., YASUDA et al., and PROAKIS et al. set forth above with respect to claim 1" (Appeal Brief, page 20, lines 16-19).

The examiner respectfully disagrees. Appellant does not discuss the references applied against the claims, explaining how the claims avoid the references or distinguish from them. In fact, the combination of Barham, Yasuda and Proakis disclose the claimed limitation (see issue *A* and sub-issues above).

2. Claim 7

a) Appellant argues "the ratio of the number of upstream channels demodulated by a CMTS channel bank to a number of upstream input connectors of the CMTS channel bank is M, where M is 16. BARHAM et al., YASUDA et al., PROAKIS et al., and QUIGLEY et al., whether taken alone or in any reasonable combination, do not disclose or suggest the above feature" (Appeal Brief, page 21, lines 6-9).

The examiner respectfully disagrees. It is clear for those of ordinary skill in the digital television art familiar with digital filter design at the time of the invention, the

number of channel could reduce based on how fast the system can process the signal (how fast the system can switch between different filters and how fast to perform the filter process etc.). In that regard, Appellant has provided no evidence that the ratio 16 between upstream and connectors yields an unexpected result or was beyond the skill of one having ordinary skill in the art. Therefore it would have been obvious to one of ordinary skill in the art to use different ration numbers, such as 2, 10, 16, 32 or 64, etc. based on design choice for a specific requirement (i.e. 16 as claimed).

b) Appellant argues "Appellant submits that the Examiner's allegation is merely a conclusory statement of an alleged benefit of the combination." (Appeal Brief, page 22, lines 10-11).

In KSR International Co. v. Teleflex Inc., the Court found that if all the claimed elements are known in the prior art then one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yield predictable results to one of ordinary skill in the art at the time of the invention. In this case, skilled artisans would recognize organizing channel bank into upstream and downstream would be easier to connect the devices. One skilled in the art could have generally combined the elements as claimed, because the claimed elements no change in their respective functions, and the combination would have yield predictable results. Combining the CMTS bank channel as taught by Quigley to the system of Barham, Yasuda and Proakis would yield the benefit to enhance the data rate and/or reliability of upstream communications (see col. 3 lines 29-32).

It must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

3. Claims 27, 28 and 33.

Appellant merely argues without specifically point out any errors. Therefore, the examiner maintains the rejections. In fact, the combination of Barham, Yasuda and Proakis disclose the claimed limitation (see issue *A* and sub-issues above).

4. Claim 29.

a) Appellant argues “the ratio of the number of upstream channels demodulated by a CMTS channel bank to a number of upstream input connectors of the CMTS channel bank is M, where M is 16. BARHAM et al., YASUDA et al., PROAKIS et al., and QUIGLEY et al., whether taken alone or in any reasonable combination, do not disclose or suggest the above feature” (Appeal Brief, page 23, last paragraph).

The examiner respectfully disagrees. It is clear for those of ordinary skill in the digital television art familiar with digital filter design at the time of the invention, the number of channel could reduce based on how fast the system can process the signal (how fast the system can switch between different filters and how fast to perform the

filter process etc.). In that regard, Appellant has provided no evidence that the ratio 16 between upstream and connectors yields an unexpected result or was beyond the skill of one having ordinary skill in the art. Therefore it would have been obvious to one of ordinary skill in the art to use different ration numbers, such as 2, 10, 16, 32 or 64, etc. based on design choice for a specific requirement (i.e. 16 as claimed).

b) Appellant argues "Appellant submits that the Examiner's allegation is merely a conclusory statement of an alleged benefit of the combination." (Appeal Brief, page 25, lines 7-10).

In KSR International Co. v. Teleflex Inc., the Court found that if all the claimed elements are known in the prior art then one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yield predictable results to one of ordinary skill in the art at the time of the invention. In this case, skilled artisans would recognize organizing channel bank into upstream and downstream would be easier to connect the devices. One skilled in the art could have generally combined the elements as claimed, because the claimed elements no change in their respective functions, and the combination would have yield predictable results. Combining the CMTS bank channel as taught by Quigley to the system of Barham, Yasuda and Proakis would yield the benefit to enhance the data rate and/or reliability of upstream communications (see col. 3 lines 29-32).

It must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes

into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Issue D:

Appellant's arguments regarding the rejection of claims 14-15, 34-35 under 35 U.S.C. § 103(a) are not persuasive.

1. Claims 14-15.

a) Appellant argues "Claims 14 and 15 depend from claim 1. Without acquiescing in the rejection of claims 14 and 15, the disclosure of PEYROVIAN does not remedy the deficiencies in the disclosures of BARHAM et al., YASUDA et al., PROAKIS et al., and QUIGLEY et al. set forth above with respect to claim 1." (Appeal Brief, page 26, lines 5-9).

The examiner respectfully disagrees. Appellant does not discuss the references applied against the claims, explaining how the claims avoid the references or distinguish from them. In fact, the combination of Barham, Yasuda and Proakis disclose the claimed limitation (see issue *A* and sub-issues above).

b) Appellant argues "Moreover, Appellant notes that the Examiner is citing no less than five references in rejecting these claims. Appellant submits that the Examiner

is merely using impermissible hindsight to piece together a large number of references in order to attempt to arrive at Appellant's claims" (Appeal Brief, page 26, lines 11-13).

The examiner respectfully disagrees. In response to applicant's argument that the examiner has combined an excessive number of references, reliance on a large number of references in a rejection does not, without more, weigh against the obviousness of the claimed invention. See *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991).

It must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

2. Claims 34-35.

a) Appellant argues "the disclosure of PEYROVIAN does not remedy the deficiencies in the disclosures of BARHAM et al., YASUDA et al., PROAKIS et al., and QUIGLEY et al. set forth above with respect to claim 24." (Appeal Brief, page 26, last paragraph).

The examiner respectfully disagrees. Appellant does not discuss the references applied against the claims, explaining how the claims avoid the references or distinguish

from them. In fact, the combination of Barham, Yasuda and Proakis disclose the claimed limitation (see issue *A* and sub-issues above).

b) Appellant argues "Moreover, Appellant notes that the Examiner is citing no less than five references in rejecting these claims. Appellant submits that the Examiner is merely using impermissible hindsight to piece together a large number of references in order to attempt to arrive at Appellant's claims" (Appeal Brief, page 27, lines 1-3).

The examiner respectfully disagrees. In response to applicant's argument that the examiner has combined an excessive number of references, reliance on a large number of references in a rejection does not, without more, weigh against the obviousness of the claimed invention. See *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991).

It must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Issue E:

Appellant's arguments regarding the rejection of claims 9, 10, 12 and 30-32 under 35 U.S.C. § 103(a) are not persuasive.

1. Claims 9, 10, and 12.

a) Appellant argues “Claims 9, 10, and 12 depend from claim 1. Without acquiescing in the rejection of claims 9, 10, and 12, Appellant's Fig. 17(A) does not remedy the deficiencies in the disclosures of BARHAM et al., YASUDA et al., PROAKIS et al., and QUIGLEY et al. set forth above with respect to claim 1.” (Appeal Brief, page 27, lines 11-13).

The examiner respectfully disagrees. Appellant does not discuss the references applied against the claims, explaining how the claims avoid the references or distinguish from them. In fact, the combination of Barham, Yasuda and Proakis disclose the claimed limitation (see issue *A* and sub-issues above).

b) Appellant argues “Moreover, Appellant notes that the Examiner is citing no less than five references in rejecting these claims. Appellant submits that the Examiner is merely using impermissible hindsight to piece together a large number of references in order to attempt to arrive at Appellant's claims” (Appeal Brief, page 27, lines 17-20).

The examiner respectfully disagrees. Again, in response to applicant's argument that the examiner has combined an excessive number of references, reliance on a large number of references in a rejection does not, without more, weigh against the obviousness of the claimed invention. See *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991).

It must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the

claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

2. Claims 30-32.

a) Appellant argues "Appellant's Fig. 17(A) does not remedy the deficiencies in the disclosures of BARHAM et al., YASUDA et al., PROAKIS et al., and QUIGLEY et al. set forth above with respect to claim 24." (Appeal Brief, page 28, lines 1-5).

The examiner respectfully disagrees. Appellant does not discuss the references applied against the claims, explaining how the claims avoid the references or distinguish from them. In fact, the combination of Barham, Yasuda and Proakis disclose the claimed limitation (see issue *A* and sub-issues above).

b) Appellant argues "Moreover, Appellant notes that the Examiner is citing no less than five references in rejecting these claims. Appellant submits that the Examiner is merely using impermissible hindsight to piece together a large number of references in order to attempt to arrive at Appellant's claims" (Appeal Brief, page 28, lines 9-11).

The examiner respectfully disagrees. Again, in response to applicant's argument that the examiner has combined an excessive number of references, reliance on a large number of references in a rejection does not, without more, weigh against the obviousness of the claimed invention. See *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991).

It must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

11/23/2010

Conferees:

Jun Fei Zhong

/Jun Fei Zhong/

Examiner, Art Unit 2426

Hai Tran

/HAI TRAN/

Primary Examiner, Art Unit 2426

/Joseph P. Hirl/

Supervisory Patent Examiner, Art Unit 2426

December 6, 2010